Engineers book of tables for railway construction

ENGINEERS'

BOOK OF TABLES

FOR

RAILWAY CONSTRUCTION,

(DOUBLE TRACK),

COMPILED FOR

ENGINEERING DEPARTMENT

OF

N. Y., WEST SHORE & BUFFALO

AND

NEW YORK, ONTARIO & WESTERN RAILWAYS.

JUNE, 1882.

Stations Corresponding to Miles

N.Y.W.S. and B.Ry.

Miles	Stations	Miles	Stations	Miles	Stations	Miles	Stations	Miles	Stations	Miles	Stations	Miles	Stations
1	52.80	51	2692.80	101	5332.80	151	7972.80	201	10612.80	251	13252.80	301	15892.80
2	105.60	52	2745.60	102	5385.60	152	8025.60	202	10665.60	252	13305.60	302	15945.60
3	158.40	53	2798.40	103	5438.40	153	8078.40	203	10718.40	253	13358.40	303	15998.40
4	211.20	54	2851.20	104	5491.20	154	8131.20	204	10771.20	254	13411.20	304	16051.20
5	264.00	55	2904.00	105	5544.00	155	8184.00	205	10824.00	255	13464.00	305	16104.00
6	316.80	56	2956.80	106	5596.80	156	8236.80	206	10876.80	256	13576.80	306	16156.80
7	369.60	57	3009.60	107	5649.60	157	8289.60	207	10929.60	257	13569.60	307	16209.60
8	422.40	58	3062.40	108	5702.40	158	8342.40	208	10982.40	258	13622.40	308	16262.40
9	475.20	59	3115.20	109	5755.20	159	8395.20	209	11035.20	259	13675.20	309	16315.20
10	528.00	60	3168.00	110	5808.00	160	8448.00	210	11088.00	260	13728.00	310	16368.00
11	580.00	61	3220.80	111	5860.80	161	8500.80	211	11140.80	261	13780.80	311	16420.80
12	633.60	62	3273.60	112	5913.60	162	8553.60	212	11193.60	262	13833.60	312	16473.60
13	686.40	63	3326.40	113	5966.40	163	8606.40	213	11246.40	263	13886.40	313	16526.40
14	739.20	64	3379.20	114	6019.20	164	8659.20	214	11299.20	264	13939.20	314	16579.20
15	792.00	65	3432.00	115	6072.00	165	8712.00	215	11352.00	265	13992.00	315	16632.00
16	844.80	66	3484.80	116	6124.80	166	8764.80	216	11404.80	266	14044.80	316	16684.80
17	897.60	67	3537.60	117	6177.60	167	8817.60	217	11457.60	267	14097.60	317	16737.60
18	950.40	68	3590.40	118	6230.40	168	8870.40	218	11510.40	268	14150.40	318	16790.40
19	1003.20	69	3643.20	119	6283.20	169	8923.20	219	11563.20	269	14203.20	319	16843.20
20	1056.00	70	3696.00	120	6336.00	170	8976.00	220	11616.00	270	14256.00	320	16896.00
21	1108.80	71	3748.80	121	6388.80	171	9028.80	221	11668.80	271	14308.80	321	16948.80
22	1161.60	72	3801.60	122	6441.60	172	9081.60	222	11721.60	272	14361.60	322	17001.60
23	1214.40	73	3854.40	123	6494.40	173	9134.40	223	11774.40	273	14414.40	323	17054.40
24	1267.20	74	3907.20	124	6547.20	174	9187.20	224	11827.20	274	14467.20	324	17107.20
25	1320.20	75	3960.00	125	6600.00	175	9240.00	225	11880.00	275	14520.00	325	17160.00
26	1372.80	76	4012.80	126	6652.80	176	9292.80	226	11932.80	276	14572.80	326	17212.80
27	1425.60	77	4065.60	127	6705.60	177	9345.60	227	11985.60	277	14625.60	327	17265.60
28	1478.40	78	4118.40	128	6758.40	178	9398.40	228	12038.40	278	14678.40	328	17318.40
29	1531.20	79	4171.20	129	6811.20	179	9451.20	229	12091.20	279	14731.20	329	17371.20
30	1584.00	80	4224.00	130	6864.00	180	9504.00	230	12144.00	280	14784.00	330	17424.00
31	1636.80	81	4276.80	131	6916.80	181	9556.80	231	12196.80	281	14836.80	331	17476.80
32	1689.60	82	4329.60	132	6969.60	182	9609.60	232	12249.60	282	14889.60	332	17529.60
33	1742.40	83	4382.40	133	7022.40	183	9662.40	233	12302.40	283	14942.40	333	17582.40
34	1795.20	84	4435.20	134	7075.20	184	9715.20	234	12355.20	284	14995.20	334	17635.20
35	1848.00	85	4488.00	135	7128.00	185	9768.00	235	12408.00	285	15048.00	335	17688.00
36	1900.80	86	4540.80	136	7180.80	186	9820.80	236	12460.80	286	15100.80	336	17740.80
37	1953.60	87	4593.60	137	7233.60	187	9871.60	237	12573.60	287	15153.60	337	17793.60
38	2006.40	88	4646.40	138	7286.40	188	9926.40	238	12566.40	288	15206.40	338	17846.40
39	2059.20	89	4699.20	139	7339.20	189	9997.20	239	12619.20	289	15259.20	339	17899.20
40	2112.00	90	4752.00	140	7392.00	190	10032.00	240	12672.00	290	15312.00	340	17952.00
41	2164.80	91	4804.80	141	7444.80	191	10084.80	241	12724.80	291	15364.80	341	18004.80
42	2217.60	92	4857.60	142	7497.60	192	10137.60	242	12777.60	292	15417.60	342	18057.60
43	2270.40	93	4910.40	143	7550.40	193	10190.40	243	12830.40	293	15470.40	343	18110.40
44	2323.20	94	4963.20	144	7603.20	194	10243.20	244	12883.20	294	15523.20	344	18163.20
45	2376.00	95	5016.00	146	7656.00	195	10296.00	245	12936.00	295	15576.00	345	18216.00
46	2428.80	96	5068.80	146	7708.80	196	10348.80	246	12988.80	296	15628.80	346	18268.80
47	2481.60	97	5121.60	147	7761.60	197	10401.60	247	13041.60	297	15681.60	347	18321.60
48	2534.40	98	5174.40	148	7814.40	198	10454.40	248	13094.40	298	15734.40	348	18374.40
49	2587.20	99	5227.20	149	7867.20	199	10507.20	249	13147.20	299	15787.20	349	18427.20
50	2640.00	100	5280.00	150	7920.00	200	10560.00	250	13200.00	300	15840.00	350	18480.00

Prof. Baker 8

CUBIC YARDS FOR EACH HUNDRED FEET IN LENGTH, LEVEL CUTTINGS.

DEPTH	SLOPE 1:1 BASE 28 Ft	SLOPE 1½:1 BASE 28 Ft	SLOPE 1¼:1 BASE 30 Ft	SLOPE 1½:1 BASE 30 Ft.	SLOPE 1:1 BASE 33 Ft	SLOPE 1½:1 BASE 33 Ft	SLOPE 2:1 BASE 33 Ft	DEPTH	SLOPE 1:1 BASE 28 Ft	SLOPE 1½:1 BASE 28 Ft	SLOPE 1¼:1 BASE 30 Ft	SLOPE 1½:1 BASE 30 Ft	SLOPE 1:1 BASE 33 Ft	SLOPE 1½:1 BASE 33 F	SLOPE 2:1 BASE 33 Ft
1.	1074	109.3	113	114	125	127	134	31.	6774	8554	4335	5223	7347	9128	14467
2.	222.2	229.6	226	230	260	267	228	32.	7111	9007	4504	5452	7703	9601	15288
3.	344.4	361.2	341	350	400	418	467	33.	7456	9472	4676	5684	8066	10085	16133
4.	474.1	503.7	460	473	550	578	667	34.	7807	9948	4848	5919	8437	10578	17000
5.	611.1	657.5	579	602	705	750	889	35.	8167	10435	5083	6157	8814	11084	17888
6.	755.6	822.2	701	734	765	933	1133	36.	8533	10933	5199	6399	9201	11600	18800
7.	907.5	978.1	823	869	1035	1128	1400	37.	8907	11443	5379	6646	9593	11128	19733
8.	1067.	1185	948	1007	1215	1334	1688	38.	9289	11963	5560	6897	9993	12667	20688
9.	1233.	1383	1074	1149	1400	1550	2001	39.	9678	12494	5742	7150	10400	13216	21667
10.	1407.	1592	1204	1296	1590	1778	2333	40.	10074	13037	5927	7407	10816	13779	22663
11.	1589	1812	1335	1447	1795	2017	2688	41.	10478	13591	6111	7669	11237	14350	23689
12.	1778	2044	1467	1600	2000	2267	3066	42.	10889	14156	6300	7933	11666	14933	24733
13.	1974	2287	1602	1757	2215	2528	3469	43.	11307	14731	6489	8201	12103	15528	25800
14.	2178	2541	1736	1919	2435	2800	3889	44.	11733	15318	6682	8474	12548	16133	26889
15.	2389	2806	1875	2083	2715	3083	4333	45.	12167	15917	6876	8751	12999	16750	28000
16.	2607	3081	2014	2251	2900	3378	4800	46.	12607	16526	7071	9030	13630	17377	29133
17.	2833	3368	2157	2424	3150	3683	5289	47.	13056	17146	7267	9313	13926	18017	30289
18.	3067	3667	2301	2601	3400	3999	5799	48.	13511	17778	7467	9599	14399	18667	31467
19.	3307	3976	2446	2780	3660	4327	6333	49.	13714	18420	7668	9891	14882	19327	32666
20.	3556	4296	2592	2963	3925	4666	6889	50.	14444	19074	7870	10186	15370	20000	33889
21.	3811	4627	2741	3149	4200	5017	7467	51.	14922	19739	8075	10484	15767	20683	35133
22.	4074	4970	2893	3341	4548	5377	8080	52.	15407	20415	8281	10785	16370	21377	36400
23.	4344	5324	3045	3536	4770	5751	8689	53.	15900	21102	8489	11090	16881	22083	37689
24.	4622	5689	3200	3734	5067	6133	9332	54.	16400	21800	8700	11400	17400	22800	39000
25.	4907	6065	3356	3935	5370	6527	10000	55.	16907	22509	8913	11714	17925	23527	40334
26.	5200	6451	3514	4140	5671	6933	10689	56.	17422	23230	9126	12030	18460	24257	41688
27.	5500	6850	3675	4352	6000	7350	11400	57.	17944	23961	9341	12350	19000	25016	43067
28.	5807	7259	3838	4564	6325	7777	12134	58.	18474	24704	9560	12673	19548	25778	44467
29.	6122	7680	4001	4780	6659	8217	12888	59.	19011	25457	9779	13002	20103	26551	45888
30.	6444	8111	4166	5000	7000	8666	13667	60.	19556	26222	10001	13334	20222	27333	47333

MASONRY IN SINGLE BOX CULVERT

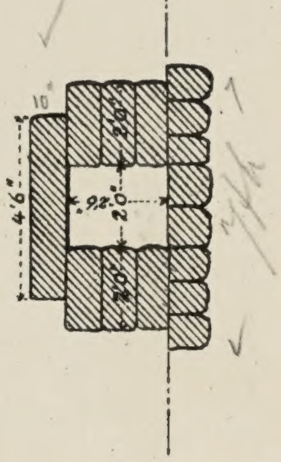
2'x 2½' OPENING

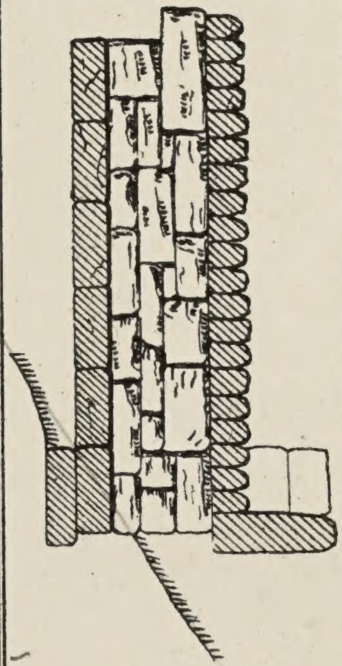
N.Y.W.S. AND B. RY.-DOUBLE TRACK

2-4

LENGTH OF CULVERT	HEIGHT OF EMBANK'T.	END WALLS CU. YDS.		TRUNK CU. YDS.		PAVING CU. YDS.		TOTAL CU. YDS.	
38	5	9	47	17	31	9	48	36	26
41	6	9	47	18	84	10	26	38	57
44	7	9	47	20	37	11	04	40	88
47	8	9	47	21	90	11	81	43	18
50	9	9	47	23	43	12	59	45	49
53	10	9	47	24	95	13	37	47	79
56	11	9	47	26	48	14	15	50	10
59	12	9	47	28	01	14	93	52	41
62	13	9	47	29	54	15	70	54	71
65	14	9	47	31	06	16	48	57	01
68	15	9	47	32	59	17	26	59	32
71	16	9	47	34	12	18	04	61	63
74	17	9	47	35	65	18	81	63	93
77	18	9	47	37	18	19	59	66	24
80	19	9	47	38	70	20	37	68	54
83	20	9	47	40	23	21	15	70	85
86	21	9	47	41	76	21	93	73	16
89	22	9	47	43	29	22	70	75	46
92	23	9	47	44	81	23	48	77	76
95	24	9	47	46	34	24	26	80	07
98	25	9	47	47	87	25	04	82	38
101	26	9	47	49	40	25	81	84	68
104	27	9	47	50	93	26	59	86	99
107	28	9	47	52	45	27	37	89	29
110	29	9	47	53	98	28	15	91	60
113	30	9	47	55	51	28	93	93	91
116	31	9	47	57	04	29	70	96	21
119	32	9	47	58	56	30	48	98	51
122	33	9	47	60	09	31	26	100	82
125	34	9	47	61	62	32	04	103	13
128	35	9	47	63	15	32	81	105	43
131	36	9	47	64	68	33	59	107	74
134	37	9	47	66	20	34	37	110	04
137	38	9	47	67	73	35	15	112	35
140	39	9	47	69	26	35	93	114	66
143	40	9	47	70	79	36	70	116	96

SECTIONS OF CULVERT





Scale 1ft = 1/8 in

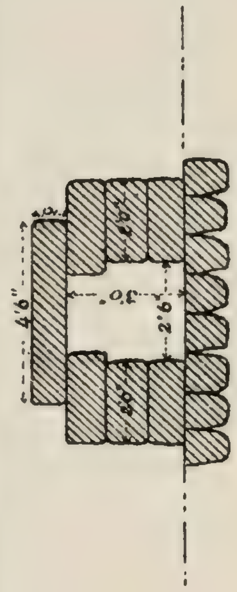
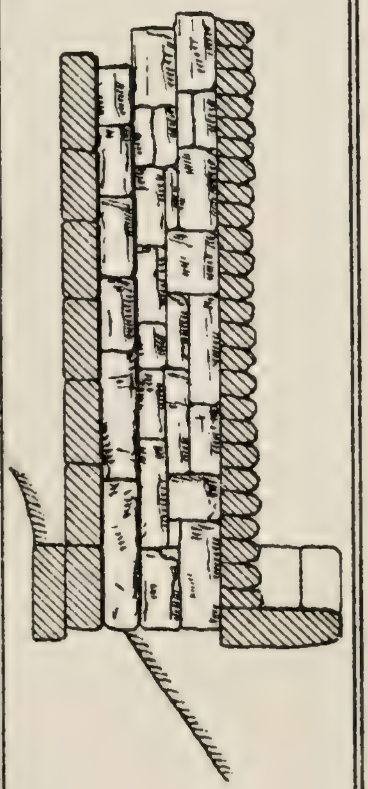
.50 9 1/6 .25 9 1/3 ✓
or = 7 cu ft

[illegible] counts with end wall

MASONRY IN SINGLE BOX CULVERT

2½'x 3' OPENING

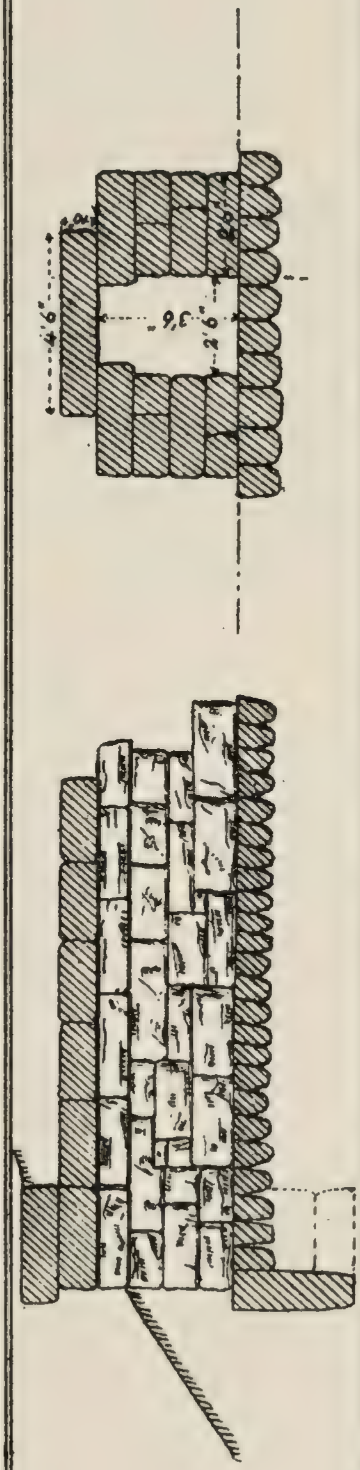
N.Y.W. S. AND B. RY.-DOUBLE TRACK

LENGTH OF CULVERT	HEIGHT OF EMBANK'T.	END WALLS		TRUNK		PAVING		TOTAL		SECTIONS OF CULVERT
		CU. YDS.		CU. YDS.		CU. YDS.		CU. YDS.		
38	6	12	08	20	46	10	28	42	82	 
41	7	12	08	22	27	11	11	45	46	
44	8	12	08	24	07	11	94	48	09	
47	9	12	08	25	88	12	78	50	74	
50	10	12	08	27	69	13	61	53	38	
53	11	12	08	29	49	14	44	56	01	
56	12	12	08	31	30	15	28	58	66	
59	13	12	08	33	10	16	11	61	29	
62	14	12	08	34	91	16	94	63	93	
65	15	12	08	36	71	17	78	66	67	
68	16	12	08	38	52	18	61	69	21	
71	17	12	08	40	32	19	44	71	84	
74	18	12	08	42	13	20	28	74	49	
77	19	12	08	43	94	21	11	77	13	
80	20	12	08	45	74	21	94	79	76	
83	21	12	08	47	55	22	78	82	41	
86	22	12	08	49	35	23	61	85	04	
89	23	12	08	51	16	24	44	87	68	
92	24	12	08	52	96	25	28	90	32	
95	25	12	08	54	77	26	11	92	96	
98	26	12	08	56	57	26	94	95	59	
101	27	12	08	58	38	27	78	98	24	
104	28	12	08	60	19	28	61	100	88	
107	29	12	08	61	99	29	44	103	51	
110	30	12	08	63	80	30	28	106	16	
113	31	12	08	65	60	31	11	108	79	
116	32	12	08	67	41	31	94	111	43	
119	33	12	08	69	21	32	78	114	07	
122	34	12	08	71	02	33	61	116	71	
125	35	12	08	72	82	34	44	119	34	
128	36	12	08	74	63	35	28	121	99	
131	37	12	08	76	44	36	11	124	63	
134	38	12	08	78	24	36	94	127	26	
137	39	12	08	80	05	37	78	129	91	
140	40	12	08	81	85	38	61	132	54	

MASONRY IN SINGLE BOX CULVERT

2½x3½ OPENING

N.Y.W.S. AND B. RY.-DOUBLE TRACK

LENGTH OF CULVERT	HEIGHT OF EMBANK'T.	ENDWALLS		TRUNK		PAVING		TOTAL		SECTIONS OF CULVERT
		CU. YDS.		OU. YDS.		CU. YDS.		CU. YDS.		
39	6	16	40	27	39	11	63	55	42	
42	7	16	40	29	81	12	57	58	78	
45	8	16	40	32	22	13	52	62	14	
48	9	16	40	34	64	14	46	65	56	
51	10	16	40	37	06	15	41	68	87	
54	11	16	40	39	47	16	35	72	12	
57	12	16	40	41	89	17	30	75	59	
60	13	16	40	44	31	18	24	78	95	
63	14	16	40	46	72	19	19	82	31	
66	15	16	40	49	14	20	13	85	67	
69	16	16	40	51	56	21	07	89	03	
72	17	16	40	53	97	22	02	92	39	
75	18	16	40	56	39	22	96	95	75	
78	19	16	40	58	81	23	91	99	12	
81	20	16	40	61	22	24	85	102	47	
84	21	16	40	63	64	25	80	105	84	
87	22	16	40	66	06	26	74	109	20	
90	23	16	40	68	47	27	69	112	56	
93	24	16	40	70	89	28	63	115	92	
96	25	16	40	73	31	29	57	119	28	
99	26	16	40	75	72	30	52	122	64	
102	27	16	40	78	14	31	46	126	00	
105	28	16	40	80	56	32	41	129	37	
108	29	16	40	82	97	33	35	132	72	
111	30	16	40	85	39	34	30	136	09	
114	31	16	40	87	81	35	24	139	45	
117	32	16	40	90	22	36	19	142	81	
120	33	16	40	92	64	37	13	146	17	
123	34	16	40	95	06	38	07	149	53	
126	35	16	40	97	47	39	02	152	89	
129	36	16	40	99	89	39	96	156	25	
132	37	16	40	102	31	40	91	159	62	
135	38	16	40	104	72	41	85	162	97	
138	39	16	40	107	14	42	80	166	34	
141	40	16	40	109	56	43	74	169	70	

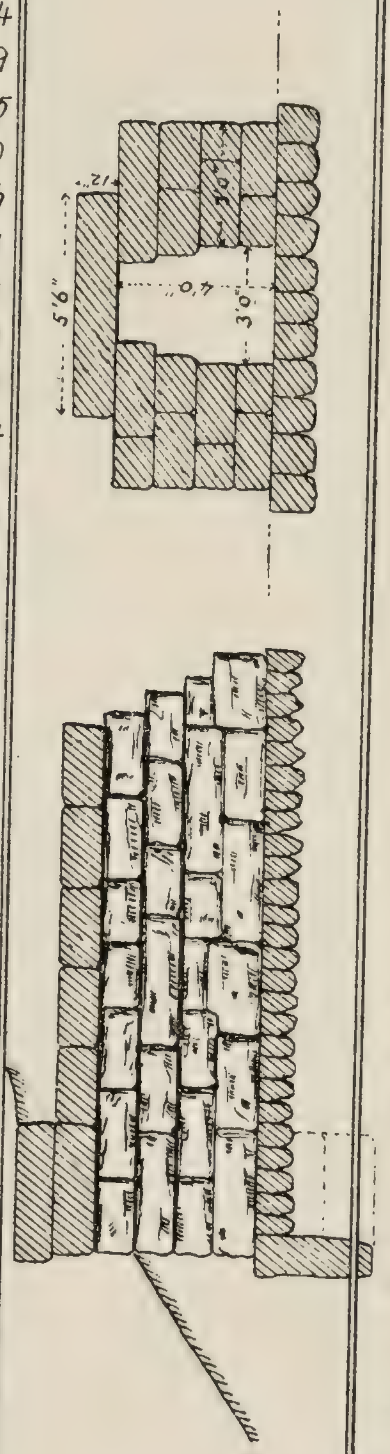
MASONRY IN SINGLE BOX CULVERT

3'x 4' OPENING

N.Y.W.S. AND B RY.-DOUBLE TRACK

LENGTH OF CULVERT	HEIGHT OF EMBANK'T.	ENDWALLS CU. YDS.		TRUNK CU. YDS.		PAVING CU. YDS.		TOTAL CU. YDS.	
40	7	23	92	39	04	13	81	76	77
43	8	23	92	42	48	14	93	81	33
46	9	23	92	45	93	16	04	85	89
49	10	23	92	49	37	17	15	90	44
52	11	23	92	52	81	18	26	94	99
55	12	23	92	56	26	19	37	99	55
58	13	23	92	59	70	20	48	104	10
61	14	23	92	63	15	21	59	108	66
64	15	23	92	66	59	22	70	113	21
67	16	23	92	70	04	23	81	117	77
70	17	23	92	73	48	24	93	122	33
73	18	23	92	76	93	26	04	126	89
76	19	23	92	80	37	27	15	131	44
79	20	23	92	83	81	28	26	135	99
82	21	23	92	87	26	29	37	140	55
85	22	23	92	90	70	30	48	144	10
88	23	23	92	94	15	31	59	149	66
91	24	23	92	97	59	32	70	154	21
94	25	23	92	101	04	33	81	158	77
97	26	23	92	104	48	34	93	163	33
100	27	23	92	107	93	36	04	167	89
103	28	23	92	111	37	37	15	172	44
106	29	23	92	114	81	38	26	176	99
109	30	23	92	118	26	39	37	181	55
112	31	23	92	121	70	40	48	185	10
115	32	23	92	125	15	41	59	190	66
118	33	23	92	128	59	42	70	195	21
121	34	23	92	132	04	43	81	199	77
124	35	23	92	135	48	44	93	203	33
127	36	23	92	138	93	46	04	208	89
130	37	23	92	142	37	47	15	213	44
133	38	23	92	145	81	48	26	217	99
136	39	23	92	149	26	49	37	222	55
139	40	23	92	152	70	50	48	227	10

SECTIONS OF CULVERT

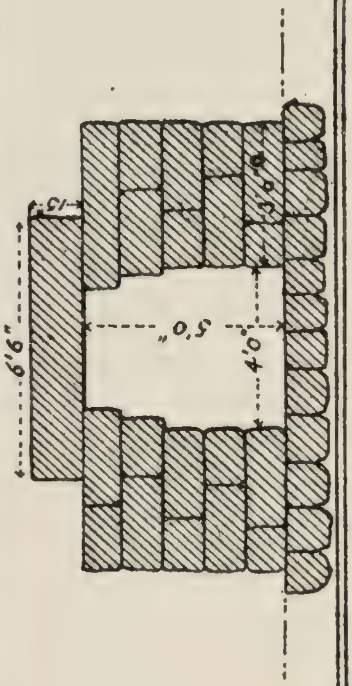


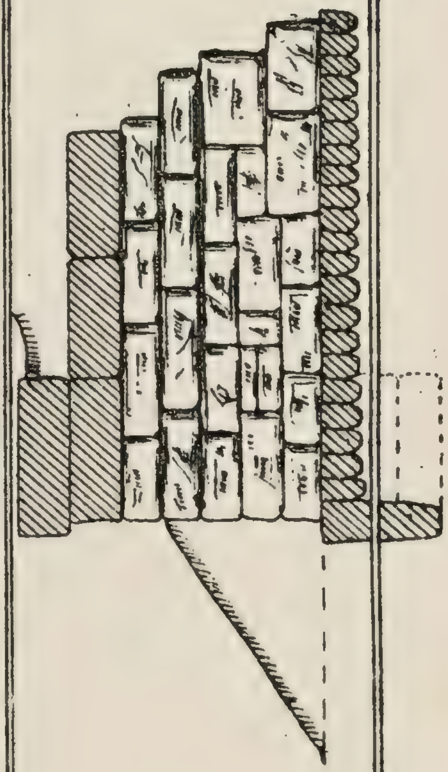
MASONRY IN SINGLE BOX CULVERT

4'x 5' OPENING

N.Y.W.S. AND B.RY.-DOUBLE TRACK

LENGTH OF CULVERT	HEIGHT OF EMBANK'T.	ENDWALLS CU.YDS.		TRUNK CU.YDS.		PAVING. CU.YDS.		TOTAL CU.YDS.		SECTIONS OF CULVERT
41	8	41	27	56	19	16	89	114	35	
44	9	41	27	61	15	18	22	120	64	
47	10	41	27	66	11	19	56	126	94	
50	11	41	27	71	07	20	89	133	23	
53	12	41	27	76	03	22	22	138	52	
56	13	41	27	80	99	23	56	145	82	
59	14	41	27	85	95	24	89	152	11	
62	15	41	27	90	90	26	22	158	39	
65	16	41	27	95	86	27	56	164	69	
68	17	41	27	100	82	28	89	170	98	
71	18	41	27	105	78	30	22	177	27	
74	19	41	27	110	74	31	56	183	57	
77	20	41	27	115	70	32	89	189	86	
80	21	41	27	120	66	34	22	196	15	
83	22	41	27	125	61	35	56	202	44	
86	23	41	27	130	57	36	89	208	73	
89	24	41	27	135	53	38	22	215	02	
92	25	41	27	140	49	39	56	222	32	
95	26	41	27	145	45	40	89	227	61	
98	27	41	27	150	41	42	22	233	90	
101	28	41	27	155	36	43	56	240	19	
104	29	41	27	160	32	44	89	245	48	
107	30	41	27	165	28	46	22	252	77	
110	31	41	27	170	24	47	56	259	07	
113	32	41	27	175	20	48	89	265	36	
116	33	41	27	180	16	50	22	271	65	
119	34	41	27	185	12	51	56	277	95	
122	35	41	27	190	07	52	89	284	23	
125	36	41	27	195	03	54	22	290	52	
128	37	41	27	199	99	55	56	296	82	
131	38	41	27	204	95	56	89	303	11	
134	39	41	27	209	90	58	22	309	39	
137	40	41	27	214	86	59	56	315	69	





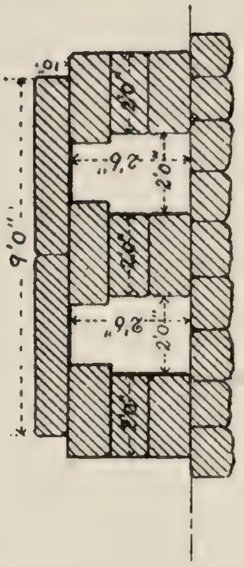
MASONRY IN DOUBLE BOX CULVERT

2'×2½' OPENING

N.Y. W. S. AND B. RY.

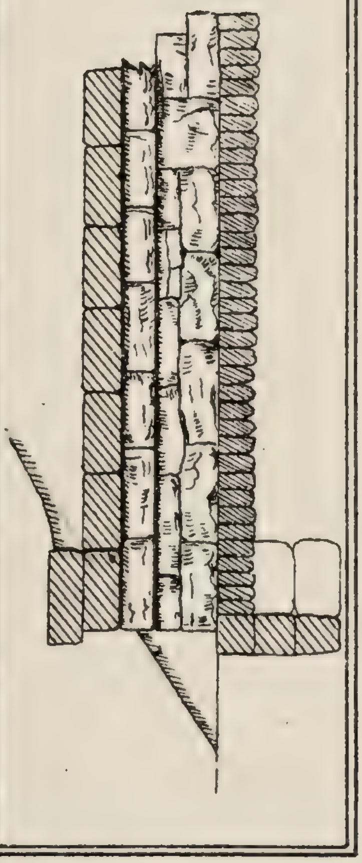
Double Track.

LENGTH OF CULVERT	HEIGHT OF EMBANK'T	END WALLS		TRUNK		PAVING		TOTAL	
		CU. YDS.		CU. YDS.		CU. YDS.		CU. YDS.	
38	5	12	49	29	38	15	19	56	96
41	6	12	49	31	98	16	41	60	88
44	7	12	49	34	57	17	63	64	69
47	8	12	49	37	16	18	85	68	50
50	9	12	49	39	75	20	07	72	31
53	10	12	49	42	35	21	30	76	14
56	11	12	49	44	94	22	52	79	95
59	12	12	49	47	53	23	74	83	76
62	13	12	49	50	12	24	96	87	57
65	14	12	49	52	72	26	19	91	40
68	15	12	49	55	31	27	41	95	21
71	16	12	49	57	90	28	63	99	02
74	17	12	49	60	49	29	85	102	83
77	18	12	49	63	09	31	07	106	65
80	19	12	49	65	68	32	30	110	47
83	20	12	49	68	27	33	52	114	28
86	21	12	49	70	86	34	74	118	09
89	22	12	49	73	46	35	96	121	91
92	23	12	49	76	05	37	19	125	76
95	24	12	49	78	64	38	41	129	54
98	25	12	49	81	23	39	63	133	35
101	26	12	49	83	83	40	85	137	17
104	27	12	49	86	42	42	07	140	98
107	28	12	49	89	01	43	30	144	80
110	29	12	49	91	61	44	52	148	62
113	30	12	49	94	20	45	74	152	43
116	31	12	49	96	79	46	96	156	24
119	32	12	49	99	38	48	19	160	06
122	33	12	49	101	98	49	41	163	88
125	34	12	49	104	57	50	63	167	69
128	35	12	49	107	16	51	85	171	50
131	36	12	49	109	75	53	07	175	31
134	37	12	49	112	35	54	30	179	14
137	38	12	49	114	94	55	52	182	95
140	39	12	49	117	53	56	74	186	76
143	40	12	49	120	12	57	96	190	57



5¼ | 2 | 1 | 2 | 1 | 5¼

10½

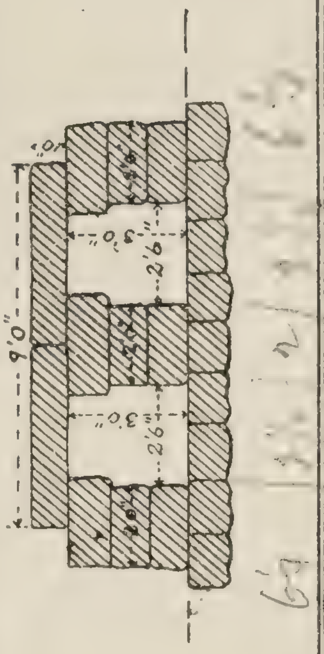


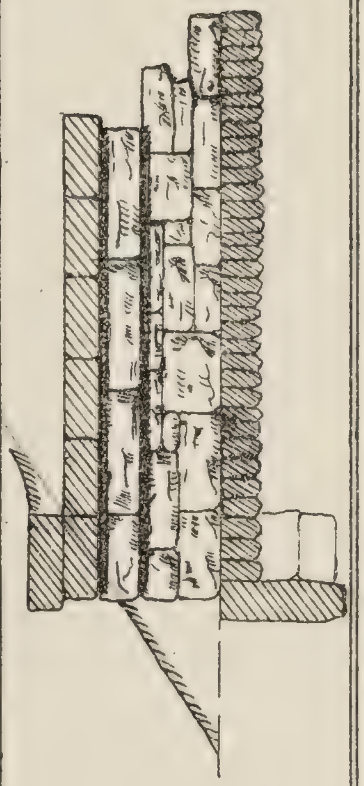
MASONRY IN DOUBLE BOX CULVERT

2 ½' x 3' OPENING

N.Y.W.S. AND B.RY.—DOUBLE TRACK

LENGTH OF CULVERT	HEIGHT OF EMBANK'T	END WALLS		TRUNK		PAVING		TOTAL	
		CU. YDS.		CU. YDS.		CU. YDS.		CU. YDS.	
38	6	15	34	33	37	16	78	65	59
41	7	15	34	36	31	18	11	69	76
44	8	15	34	39	26	19	44	74	04
47	9	15	34	42	20	20	78	78	32
50	10	15	34	45	15	22	11	82	60
53	11	15	34	48	09	23	44	86	87
56	12	15	34	51	04	24	78	91	16
59	13	15	34	53	98	26	11	95	43
62	14	15	34	56	93	27	44	99	71
65	15	15	34	59	87	28	78	103	99
68	16	15	34	62	81	30	11	108	26
71	17	15	34	65	76	31	44	112	54
74	18	15	34	68	70	32	78	116	82
77	19	15	34	71	65	34	11	121	10
80	20	15	34	74	59	35	44	125	37
83	21	15	34	77	54	36	78	129	66
86	22	15	34	80	48	38	11	133	93
89	23	15	34	83	43	39	44	138	21
92	24	15	34	86	37	40	78	142	49
95	25	15	34	89	31	42	11	146	76
98	26	15	34	92	26	43	44	151	04
101	27	15	34	95	20	44	78	155	32
104	28	15	34	98	15	46	11	159	60
107	29	15	34	101	09	47	44	163	87
110	30	15	34	104	04	48	78	168	16
113	31	15	34	106	98	50	11	172	43
116	32	15	34	109	93	51	44	177	71
119	33	15	34	112	87	52	78	181	99
122	34	15	34	115	81	54	11	185	26
125	35	15	34	118	76	55	44	189	54
128	36	15	34	121	70	56	78	193	82
131	37	15	34	124	65	58	11	198	10
134	38	15	34	127	59	59	44	202	37
137	39	15	34	130	54	60	78	206	66
140	40	15	34	133	48	62	11	210	93



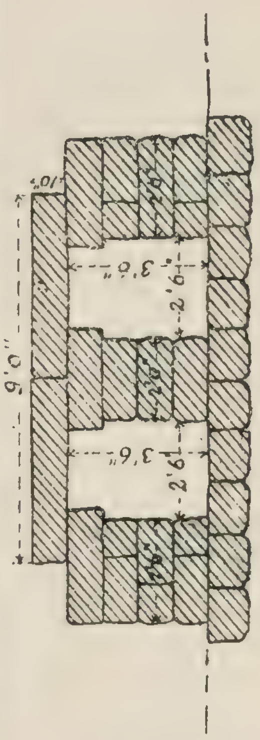


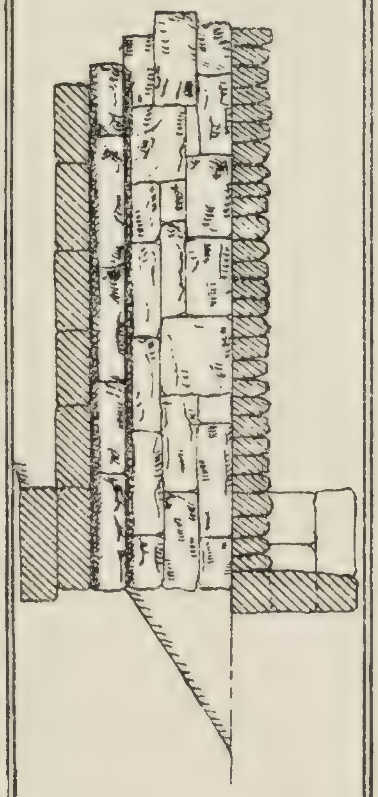
MASONRY IN DOUBLE BOX CULVERT

2 1/2'x3 1/2' OPENING

N.Y.W.S. AND B.RY.— DOUBLE TRACK

LENGTH OF CULVERT	HEIGHT OF EMBANK'T	ENDWALLS		TRUNK		PAVING		TOTAL	
		CU. YDS.		CU. YDS.		CU. YDS.		CU. YDS.	
39	6	20	58	41	56	18	22	80	33
42	7	20	58	45	22	19	67	85	47
45	8	20	58	48	89	21	11	90	58
48	9	20	58	52	56	22	56	95	70
51	10	20	58	56	22	24	00	100	80
54	11	20	58	59	89	25	44	105	91
57	12	20	58	63	56	26	89	110	03
60	13	20	58	67	22	28	33	116	13
63	14	20	58	70	89	29	78	121	25
66	15	20	58	74	56	31	22	126	36
69	16	20	58	78	22	32	67	131	47
72	17	20	58	81	89	34	11	136	58
75	18	20	58	85	56	35	56	141	70
78	19	20	58	89	22	37	00	146	80
81	20	20	58	92	89	38	44	151	91
84	21	20	58	96	56	39	89	157	03
87	22	20	58	100	22	41	33	162	13
90	23	20	58	103	89	42	78	167	25
93	24	20	58	107	56	44	22	172	36
96	25	20	58	111	22	45	67	177	47
99	26	20	58	114	89	47	11	182	58
102	27	20	58	118	56	48	56	187	70
105	28	20	58	122	22	50	00	192	80
108	29	20	58	125	89	51	44	197	91
111	30	20	58	129	56	52	89	203	03
114	31	20	58	133	22	54	33	208	13
117	32	20	58	136	89	55	78	213	25
120	33	20	58	140	56	57	22	218	36
123	34	20	58	144	22	58	67	223	47
126	35	20	58	147	89	60	11	228	58
129	36	20	58	151	56	61	56	233	70
132	37	20	58	155	22	63	00	238	58
135	38	20	58	158	89	64	44	243	91
138	39	20	58	162	56	65	89	249	03
141	40	20	58	166	22	67	33	254	13



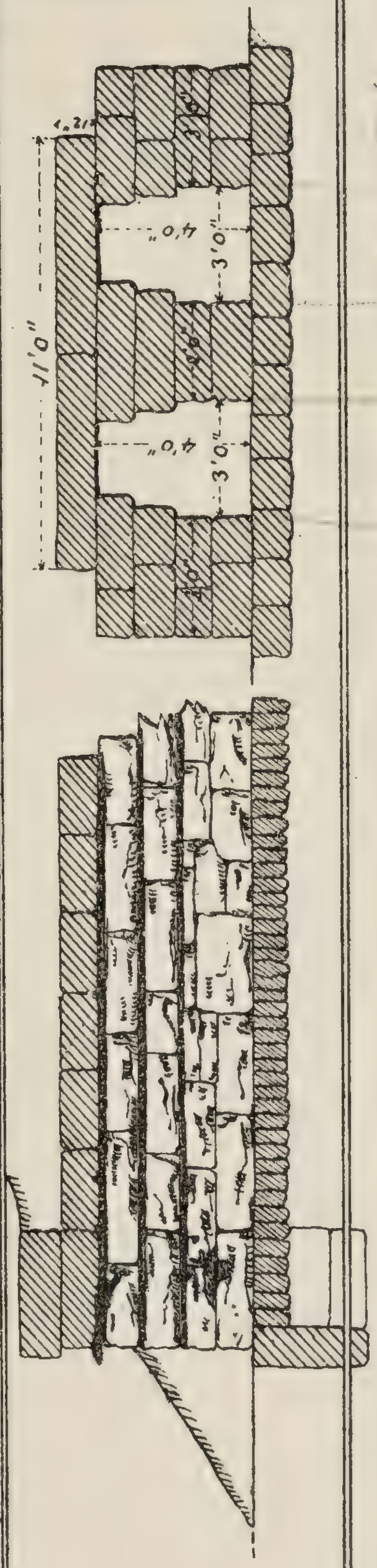


MASONRY IN DOUBLE BOX CULVERT

3'x 4' OPENING

N.Y.W.S. AND B RY.—DOUBLE TRACK

LENGTH OF CULVERT	HEIGHT OF EMBANK'T	ENDWALLS		TRUNK		PAVING		TOTAL	
		CU. YDS.		CU. YDS.		CU. YDS.		CU. YDS.	
40	7	30	96	60	44	21	96	112	36
43	8	30	96	65	78	23	69	120	43
46	9	30	96	71	11	25	41	127	48
49	10	30	96	76	44	27	13	134	53
52	11	30	96	81	78	28	85	141	59
55	12	30	96	87	11	30	57	148	64
58	13	30	96	92	44	32	30	155	70
61	14	30	96	97	78	34	02	162	76
64	15	30	96	103	11	35	74	169	81
67	16	30	96	108	44	37	46	176	86
70	17	30	96	113	78	39	19	183	93
73	18	30	96	119	11	40	91	190	98
76	19	30	96	124	44	42	63	198	03
79	20	30	96	129	78	44	35	205	09
82	21	30	96	135	11	46	07	212	14
85	22	30	96	140	44	47	80	219	20
88	23	30	96	145	78	49	52	226	26
91	24	30	96	151	11	51	24	233	31
94	25	30	96	156	44	52	96	240	36
97	26	30	96	161	78	54	69	247	43
100	27	30	96	167	11	56	41	254	48
103	28	30	96	172	44	58	13	261	53
106	29	30	96	177	78	59	85	268	59
109	30	30	96	183	11	61	57	275	64
112	31	30	96	188	44	63	30	282	70
115	32	30	96	193	78	65	02	289	76
118	33	30	96	199	11	66	74	296	81
121	34	30	96	204	44	68	46	303	86
124	35	30	96	209	78	70	19	310	93
127	36	30	96	215	11	71	91	317	98
130	37	30	96	220	44	73	63	325	03
133	38	30	96	225	78	75	35	332	09
136	39	30	96	231	11	77	07	339	14
139	40	30	96	236	44	78	80	346	20

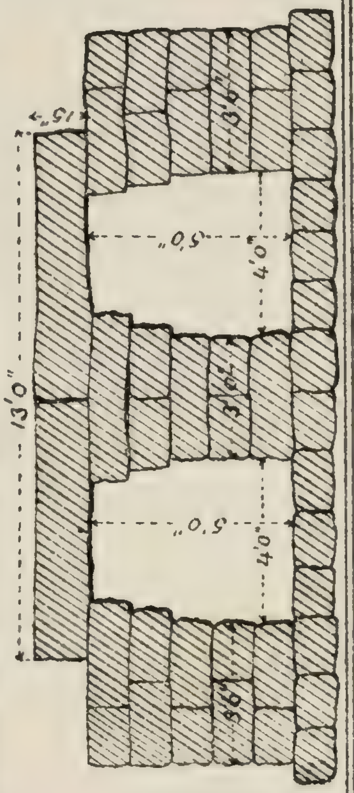


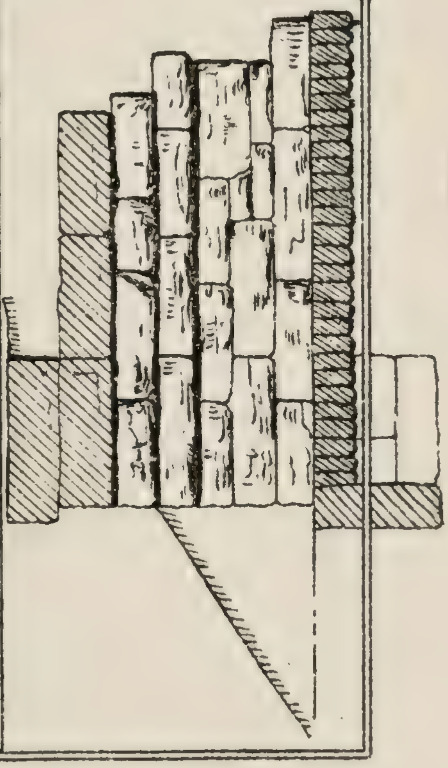
MASONRY IN DOUBLE BOX CULVERT

4 x 5 FT. OPENING

N.Y.W.S. AND B.RY.— DOUBLE TRACK

LENGTH OF CULVERT	HEIGHT OF EMBANK'T.	ENDWALLS CU.YDS.		TRUNK CU.YDS.		PAVING CU.YDS.		TOTAL CU.YDS.	
41	8	51	48	87	20	27	48	166	16
44	9	51	48	94	90	29	59	175	97
47	10	51	48	102	59	31	70	185	77
50	11	51	48	110	29	33	81	195	58
53	12	51	48	117	98	35	93	205	39
56	13	51	48	125	68	38	04	215	20
59	14	51	48	133	37	40	15	225	00
62	15	51	48	141	06	42	26	234	80
65	16	51	48	148	76	44	37	244	61
68	17	51	48	156	45	46	48	254	41
71	18	51	48	164	15	48	59	265	22
74	19	51	48	171	84	50	70	274	02
77	20	51	48	179	54	52	81	283	83
80	21	51	48	187	23	54	93	293	64
83	22	51	48	194	93	57	04	303	45
86	23	51	48	202	62	59	15	313	25
89	24	51	48	210	31	61	26	323	05
92	25	51	48	218	01	63	37	332	86
95	26	51	48	225	70	65	48	342	66
98	27	51	48	233	40	67	59	352	47
101	28	51	48	241	09	69	70	362	27
104	29	51	48	248	79	71	81	371	98
107	30	51	48	256	48	73	93	381	89
110	31	51	48	264	18	76	04	391	70
113	32	51	48	271	87	78	15	401	50
116	33	51	48	279	56	80	26	411	30
119	34	51	48	287	26	82	37	421	11
122	35	51	48	294	95	84	48	431	91
125	36	51	48	302	65	86	59	441	72
128	37	51	48	310	34	88	70	451	52
131	38	51	48	318	04	90	81	460	33
134	39	51	48	325	73	92	93	470	14
137	40	51	48	333	43	95	04	479	95





9½ | 4 | 3 | 4 | 9½

19 + 8 + 3 = 30

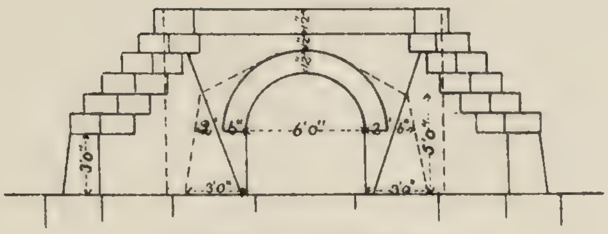
MASONRY IN ARCH CULVERT

EXCLUSIVE OF FOUNDATION

N.Y.W.S. AND B.RY.–DOUBLE TRACK

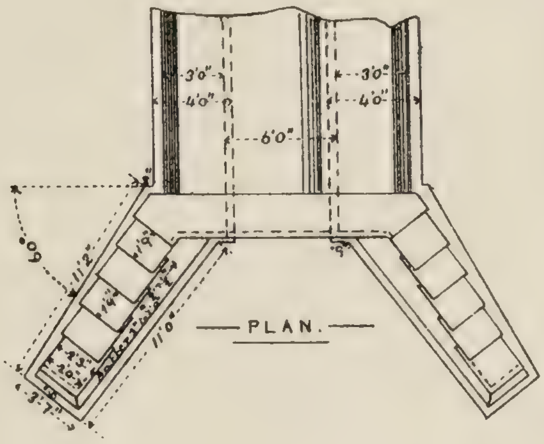
HEIGHT OF EMBANK'T.	LENGTH BETWEEN PARAPETS	CUBIC YARDS	
10	34	80	40
11	37	84	37
12	40	88	33
13	43	92	30
14	46	96	27
15	49	100	23
16	52	104	20
17	55	108	17
18	58	112	13
19	61	116	10
20	64	120	07
21	67	124	03
22	70	128	00
23	73	131	97
24	76	135	93
25	79	139	90
26	82	143	87
27	85	147	83
28	88	151	80
29	91	155	77
30	94	159	73
31	97	163	70
32	100	167	67
33	103	171	63
34	106	175	60
35	109	179	57
36	112	183	53
37	115	187	50
38	118	191	47
39	121	195	43
40	124	199	40
41	127	203	37
42	130	207	33
43	133	211	30
44	136	215	27
45	139	219	23
46	142	223	20
47	145	227	17
48	148	231	13
49	151	235	10
50	154	239	07
51	157	243	03
52	160	247	00
53	163	250	97
54	166	254	93
55	169	258	90
56	172	262	87
57	175	266	83
58	178	270	80
59	181	274	77
60	184	278	73
61	187	282	70
62	190	286	67
63	193	290	63
64	196	294	60

6 FT. SPAN



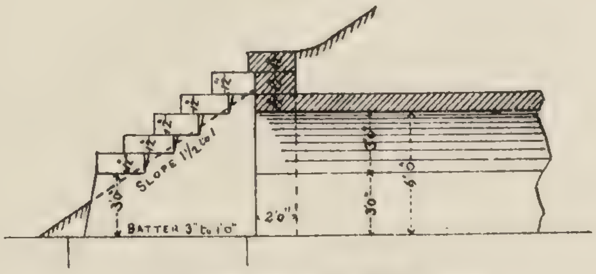
FRONT ELEVATION.

AREA OF BENCH WALLS, ARCH & SPANDRELS = 35$\frac{70}{100}$ °FT.



PLAN.

PARAPETS & WINGS = 35$\frac{45}{100}$ CU. YDS.



LONGITUDINAL SECTION

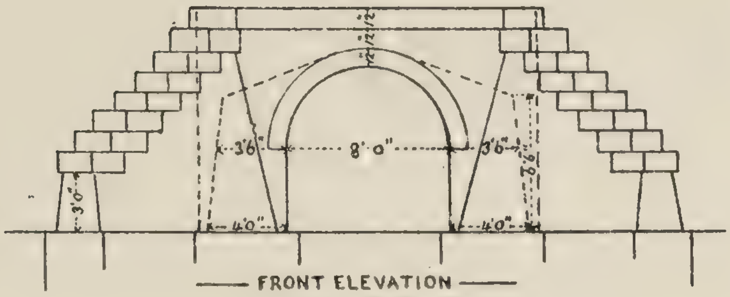
MASONRY IN ARCH CULVERT

EXCLUSIVE OF FOUNDATION

N.Y.W.S. AND B.RY.—DOUBLE TRACK

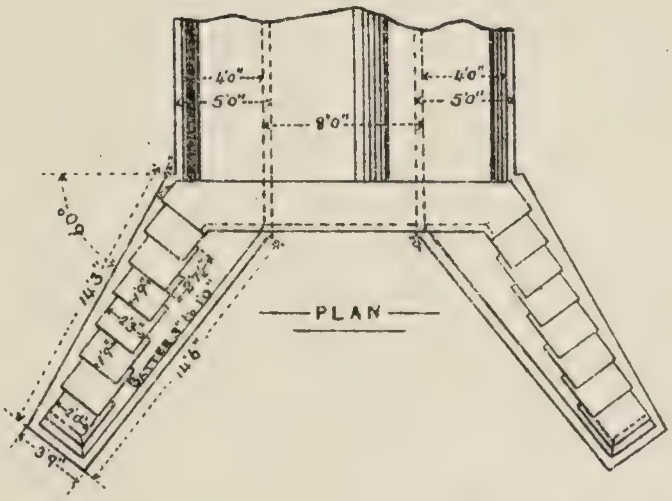
HEIGHT OF EMBANK'T	LENGTH BETWEEN PARAPETS	CUBIC YARDS	
12	34	134	47
13	37	141	35
14	40	148	22
15	43	155	10
16	46	161	97
17	49	168	84
18	52	175	72
19	55	182	59
20	58	189	47
21	61	196	34
22	64	203	22
25	67	210	09
24	70	216	97
25	73	223	84
26	76	230	71
27	79	237	59
28	82	244	46
29	85	251	34
30	88	258	21
31	91	265	09
32	94	271	96
33	97	278	84
34	100	285	71
35	103	292	58
36	106	299	46
37	109	306	33
38	112	313	21
39	115	320	08
40	118	326	96
41	121	333	83
42	124	340	71
43	127	347	58
44	130	354	45
45	133	361	33
46	136	368	20
47	139	375	08
48	142	381	95
49	145	388	83
50	148	395	70
51	151	402	58
52	154	409	45
53	157	416	32
54	160	423	20
55	163	430	07
56	166	436	95
57	169	443	82
58	172	450	70
59	175	457	57
60	178	464	45
61	181	471	32
62	184	478	19
63	187	485	07
64	190	491	94
65	193	498	82
66	196	505	69

8 FT. SPAN



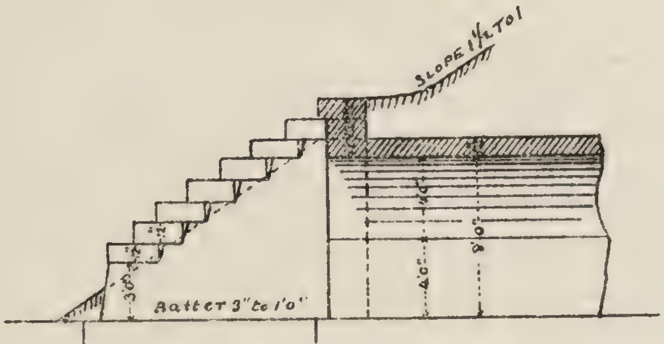
FRONT ELEVATION

AREA OF BENCH WALLS, ARCH AND SPANDRELS = 61.$\frac{27}{100}$°FT.



PLAN

PARAPETS AND WINGS = 56.$\frac{56}{100}$ CU.YDS.



LONGITUDINAL SECTION.

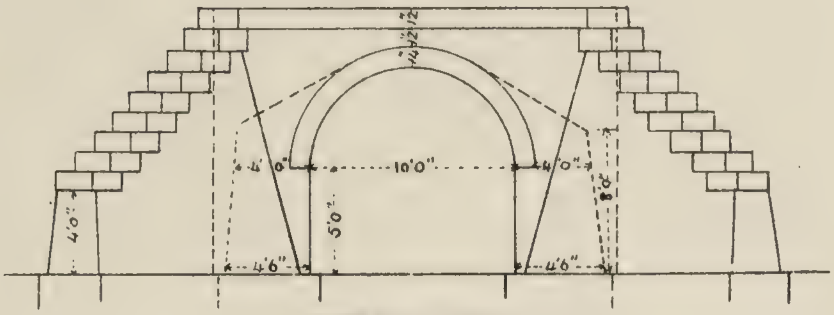
MASONRY IN ARCH CULVERT

EXCLUSIVE OF FOUNDATION

N.Y.W.S. AND B.RY.–DOUBLE TRACK

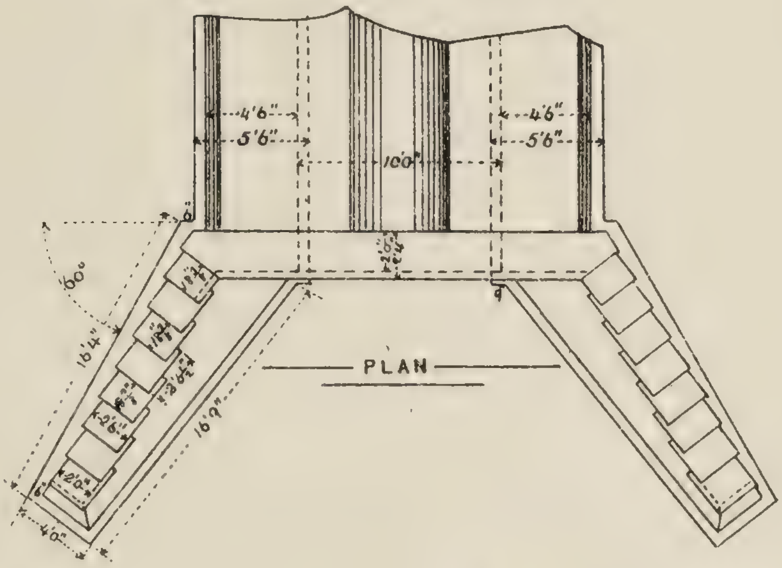
HEIGHT OF EMBANK'T.	LENGTH BETWEEN PARAPETS	CUBIC YARDS	
14	34	193	48
15	37	203	22
16	40	212	96
17	43	222	69
18	46	232	43
19	49	242	17
20	52	251	91
21	55	261	65
22	58	271	38
23	61	281	12
24	64	290	86
25	67	300	60
26	70	310	33
27	73	320	07
28	76	329	81
29	79	339	55
30	82	349	29
31	85	359	02
32	88	368	76
33	91	378	50
34	94	388	24
35	97	397	97
36	100	407	71
37	103	417	45
38	106	427	19
39	109	436	93
40	112	446	66
41	115	456	40
42	118	466	14
43	121	475	88
44	124	485	61
45	127	495	35
46	130	505	09
47	133	514	83
48	136	524	57
49	139	534	30
50	142	544	04
51	145	553	78
52	148	563	52
53	151	573	25
54	154	582	99
55	157	592	73
56	160	602	47
57	163	612	21
58	166	621	94
59	169	631	68
60	172	641	42
61	175	651	16
62	178	660	89
63	181	670	63
64	184	680	37
65	187	690	11
66	190	699	85
67	193	709	58
68	196	719	32

10 FT. SPAN



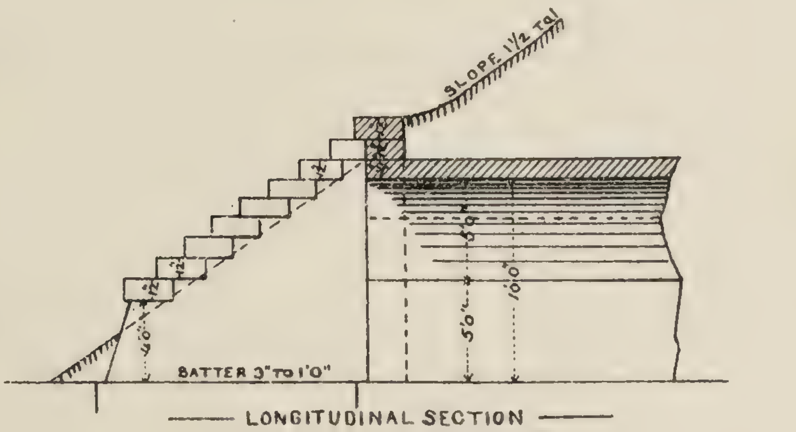
FRONT ELEVATION

AREA OF BENCH WALLS, ARCH AND SPANDRELS
87.$\frac{64}{100}$ FEET.



PLAN

PARAPETS AND WINGS = 83$\frac{12}{100}$ CU. YDS.



LONGITUDINAL SECTION

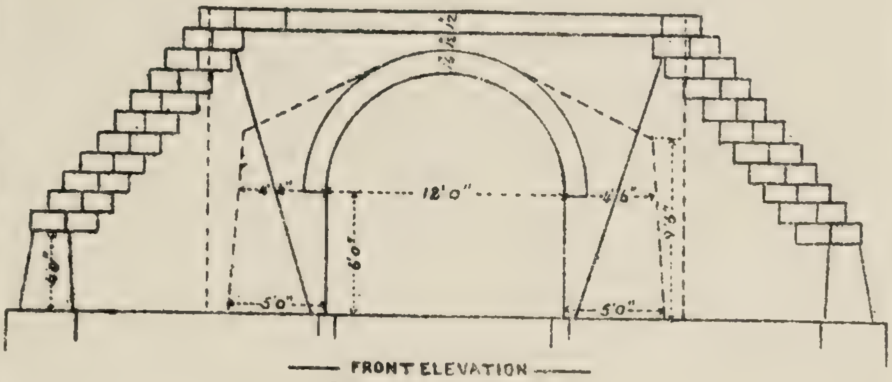
MASONRY IN ARCH CULVERT

EXCLUSIVE OF FOUNDATION

N.Y.W.S. AND B.RY.—DOUBLE TRACK

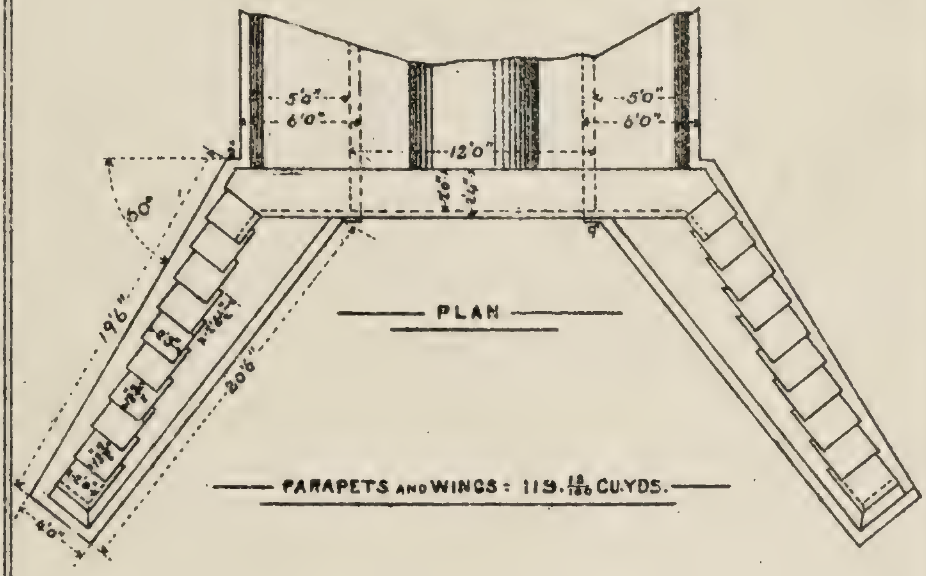
HEIGHT OF EMBANK'T.	LENGTH BETWEEN PARAPETS	CUBIC YARDS	
16	34	268	63
17	37	281	82
18	40	295	00
19	43	308	19
20	46	321	38
21	49	334	56
22	52	347	75
23	55	360	94
24	58	374	12
25	61	387	31
26	64	400	50
27	67	413	68
28	70	426	87
29	73	440	06
30	76	453	24
31	79	466	43
32	82	479	62
33	85	492	80
34	88	506	09
35	91	519	18
36	94	532	36
37	97	545	55
38	100	558	74
39	103	571	92
40	106	585	11
41	109	598	30
42	112	611	48
43	115	624	67
44	118	637	86
45	121	651	04
46	124	664	23
47	127	677	42
48	130	690	60
49	133	703	79
50	136	716	98
51	139	730	16
52	142	743	35
53	145	756	54
54	148	769	72
55	151	782	91
56	154	796	10
57	157	809	28
58	160	822	47
59	163	835	66
60	166	848	84
61	169	862	03
62	172	875	22
63	175	888	40
64	178	901	59
65	181	914	78
66	184	927	96
67	187	941	15
68	150	954	34
69	193	967	52
70	196	980	71

—12 FT. SPAN.—



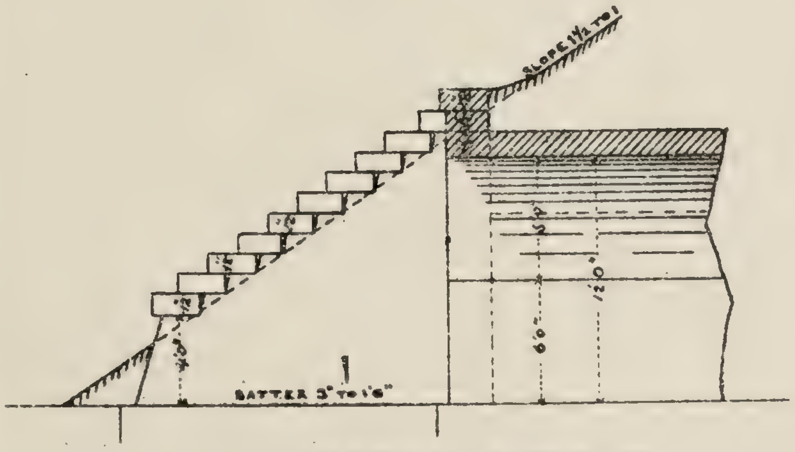
FRONT ELEVATION

AREA OF BENCH-WALLS, ARCH AND SPANDRELS.
= 118.$\frac{63}{100}$ □FT.



PLAN

PARAPETS AND WINGS = 119.$\frac{18}{100}$ CU.YDS.



LONGITUDINAL SECTION

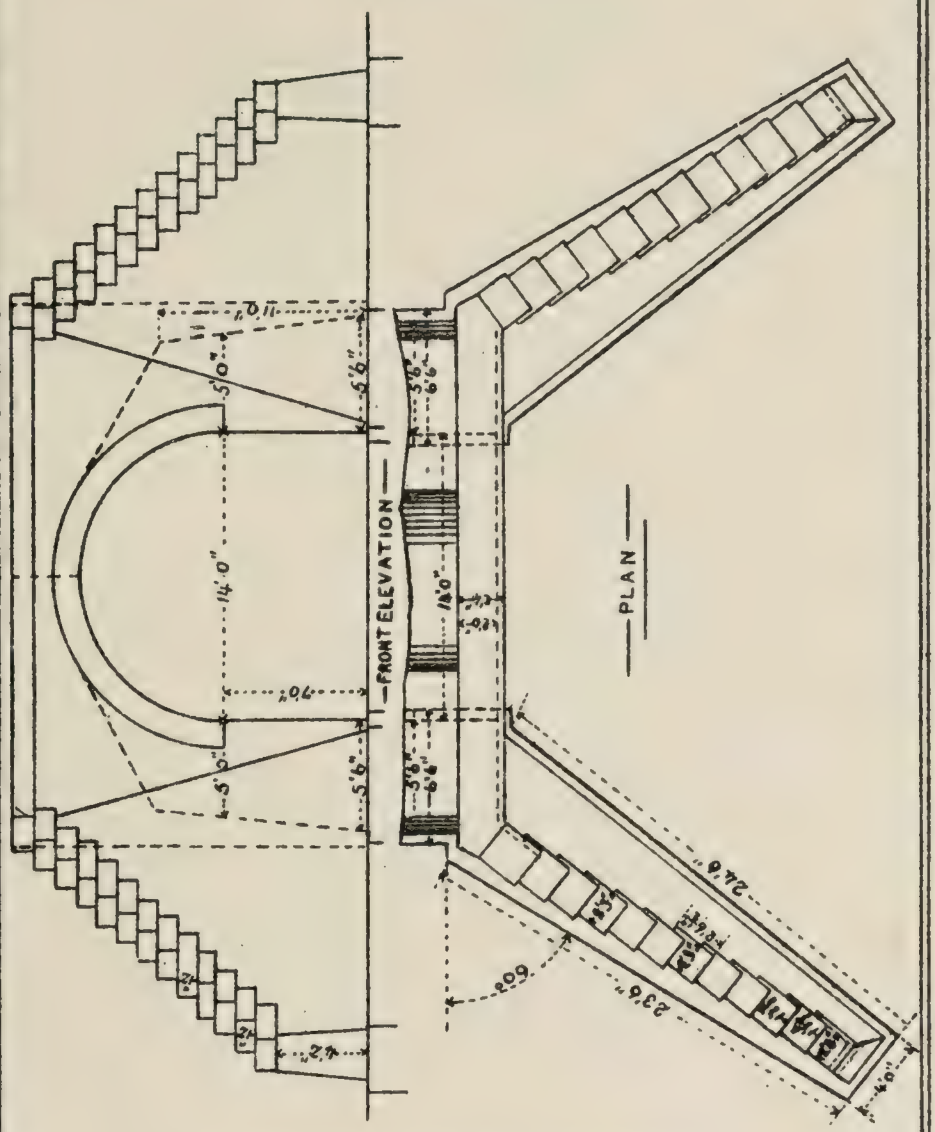
MASONRY IN ARCH CULVERT

EXCLUSIVE OF FOUNDATION

N.Y.W.S. AND B.RY.-DOUBLE TRACK

HEIGHT OF EMBANK'T.	LENGTH BETWEEN PARAPETS	CUBIC YARDS	
18	34	354	65
19	37	371	53
20	40	388	42
21	43	406	30
22	46	422	18
23	49	439	06
24	52	455	94
25	55	472	83
26	58	489	71
27	61	506	59
28	64	523	47
29	67	540	36
30	70	557	24
31	73	574	12
32	76	591	00
33	79	607	88
34	82	624	77
35	85	641	65
36	88	658	53
37	91	675	41
38	94	692	30
39	97	709	18
40	100	726	06
41	103	742	94
42	106	751	82
43	109	776	71
44	112	793	59
45	115	810	47
46	118	827	35
47	121	844	24
48	124	861	12
49	127	878	00
50	130	894	88
51	133	911	76
52	136	928	65
53	139	945	53
54	142	962	41
55	145	979	29
56	148	996	18
57	151	1013	06
58	154	1029	94
59	157	1046	82
60	160	1063	70
61	163	1080	59
62	166	1097	47
63	169	1114	35
64	172	1131	23
65	175	1148	12
66	178	1165	00
67	181	1181	88
68	184	1198	76
69	187	1215	64
70	190	1232	53
71	193	1249	41
72	196	1266	29

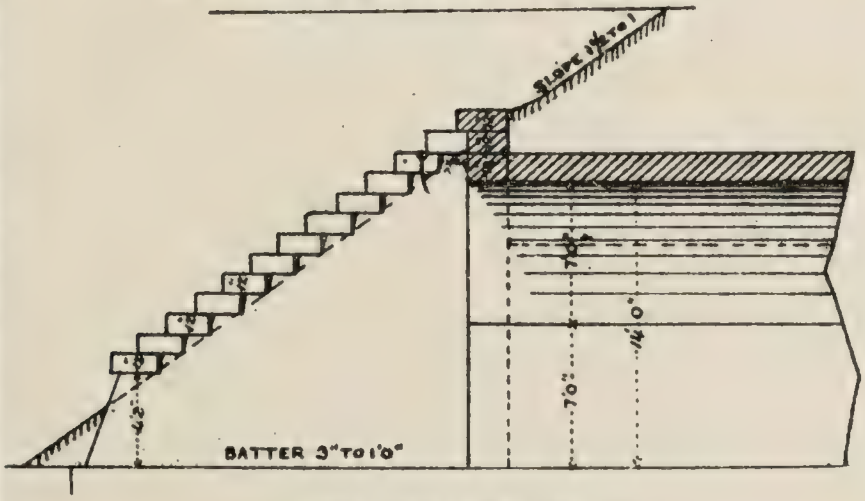
14 FT. SPAN



AREA OF BENCH WALLS, ARCH AND SPANDRELS

= 151.$\frac{94}{100}$ °FT.

PARAPETS AND WINGS = 163.$\frac{32}{100}$ CU.YDS.



LONGITUDINAL SECTION

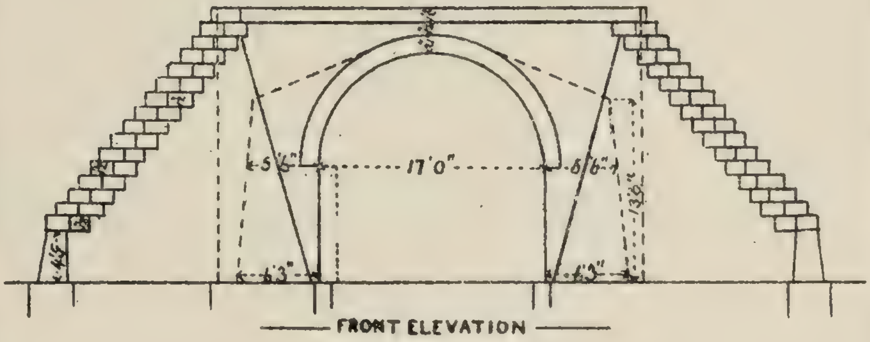
MASONRY IN ARCH CULVERT

EXCLUSIVE OF FOUNDATION

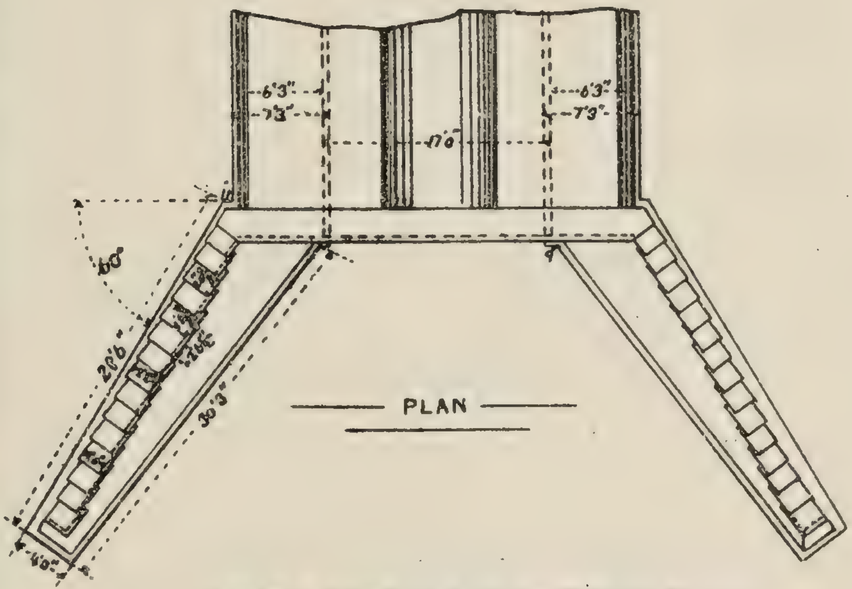
N.Y.W.S. AND B.RY.–DOUBLE TRACK

HEIGHT OF EMBANK'T.	LENGTH BETWEEN PARAPETS	CUBIC YARDS	
22	34	505	17
23	37	528	12
24	40	551	07
25	43	574	02
26	46	596	96
27	49	619	91
28	52	642	86
29	55	665	81
30	58	688	76
31	61	711	70
32	64	734	65
33	67	757	60
34	70	780	55
35	73	803	49
36	76	826	44
37	79	849	39
38	82	872	34
39	85	895	29
40	88	918	23
41	91	941	18
42	94	964	13
43	97	987	08
44	100	1010	02
45	103	1032	97
46	106	1055	92
47	109	1078	87
48	112	1101	82
49	115	1124	76
50	118	1147	71
51	121	1170	66
52	124	1193	61
53	127	1216	55
54	130	1239	50
55	133	1262	45
56	136	1285	40
57	139	1308	35
58	142	1331	29
59	145	1354	24
60	148	1377	19
61	151	1400	14
62	154	1423	08
63	157	1446	03
64	160	1468	98
65	163	1491	93
66	166	1514	88
67	169	1537	82
68	172	1560	77
69	175	1583	72
70	178	1606	67
71	181	1629	61
72	184	1652	56
73	187	1675	51
74	190	1698	46
75	193	1721	41
76	196	1744	35

17 FT. SPAN.



FRONT ELEVATION

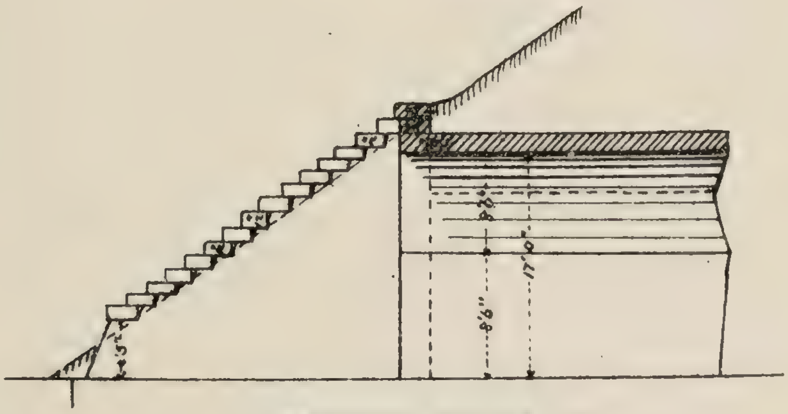


PLAN

AREA OF BENCH WALLS, ARCH & SPANDRELS

$= 206.\frac{32}{100}$ Sq. Ft.

PARAPETS AND WINGS $= 245.\frac{10}{100}$ CU. YDS.



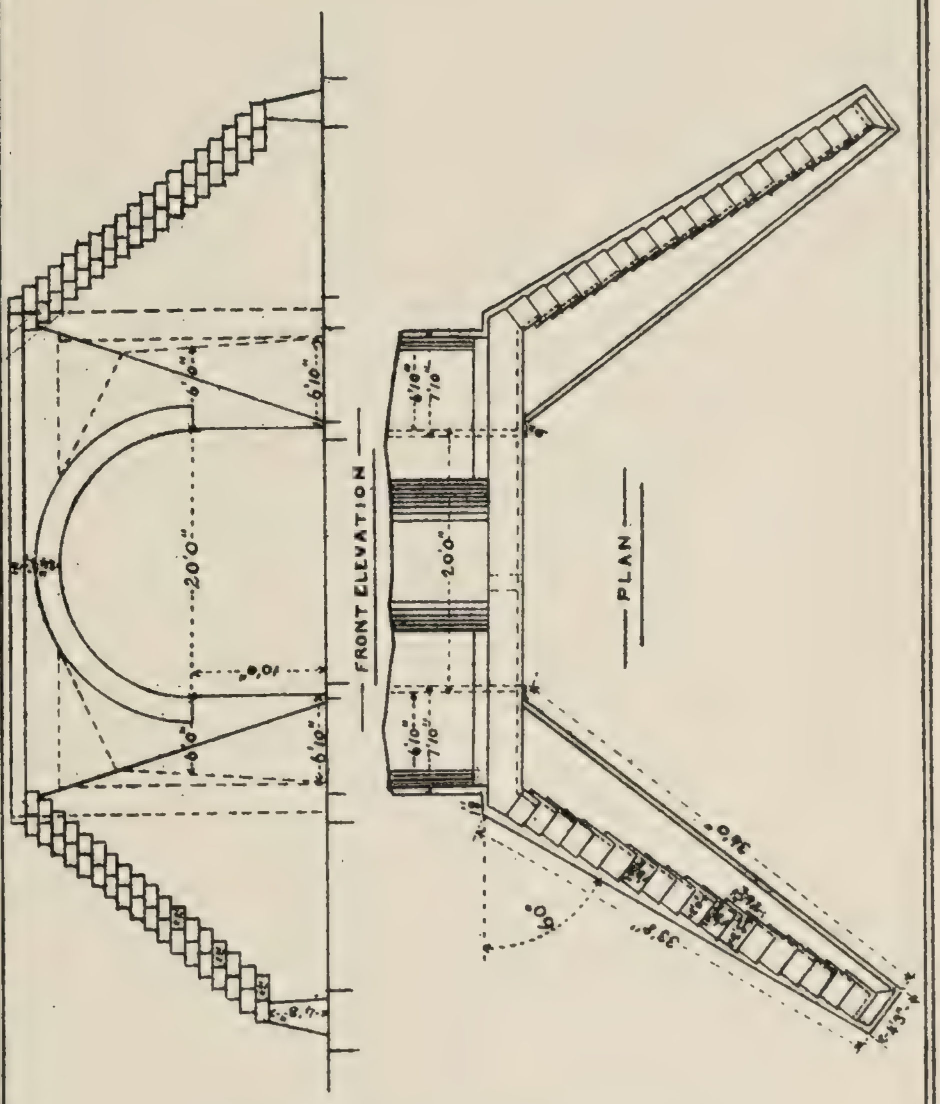
LONGITUDINAL SECTION

MASONRY IN ARCH CULVERT

EXCLUSIVE OF FOUNDATION

N.Y.W.S. AND B.RY.–DOUBLE TRACK

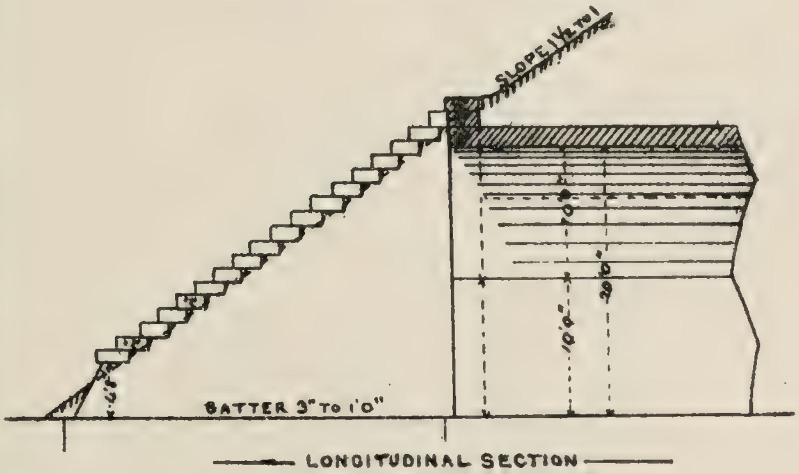
HEIGHT OF EMBANK'T.	LENGTH BETWEEN PARAPETS	CUBIC YARDS	
25	34	688	52
26	37	718	32
27	40	748	12
28	43	777	93
29	46	807	73
30	49	837	53
31	52	867	33
32	55	897	13
33	58	926	93
34	61	956	73
35	64	986	53
36	67	1016	33
37	70	1046	14
38	73	1075	94
39	76	1105	74
40	79	1135	54
41	82	1165	34
42	85	1195	14
43	88	1224	94
44	91	1254	74
45	94	1284	54
46	97	1314	35
47	100	1344	15
48	103	1373	95
49	106	1403	75
50	109	1433	55
51	112	1463	35
52	115	1493	15
53	118	1522	95
54	121	1552	75
55	124	1582	56
56	127	1612	36
57	130	1642	16
58	133	1671	96
59	136	1701	76
60	139	1731	56
61	142	1761	36
62	145	1791	16
63	148	1820	96
64	151	1850	77
65	154	1880	57
66	157	1910	37
67	160	1940	17
68	163	1969	97
69	166	1999	77
70	169	2029	57
71	172	2059	37
72	175	2089	17
73	178	2118	98
74	181	2148	78
75	184	2178	58
76	187	2208	38
77	190	2238	18
78	193	2267	98
79	196	2297	78



AREA OF BENCH WALLS, ARCH AND SPANDRELS

= 268.$\frac{31}{100}$ Sq. Ft.

PARAPETS AND WINGS = 350$\frac{78}{100}$ CU. YDS.



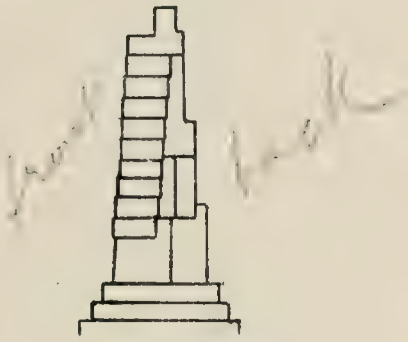
LONGITUDINAL SECTION

—MASONRY IN BRIDGE ABUTMENTS.—

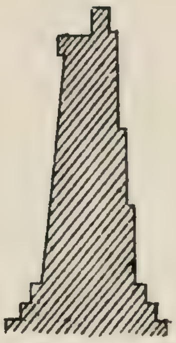
—Including 3 Ft. Foundation—

—N.Y.W.S. and B.Ry.—Double Track.—

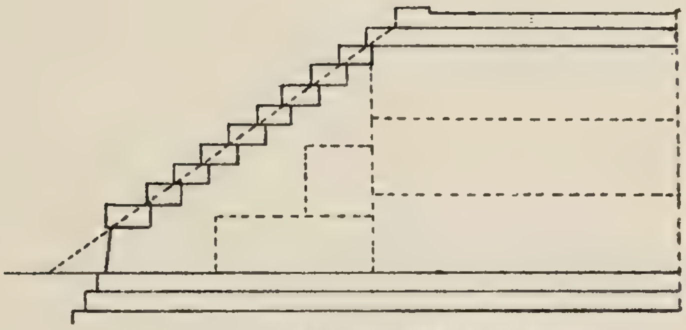
Ft.	Cu. Yds.
5	30
6	38
7	47
8	57
9	68
10	79
11	92
12	106
13	121
14	137
15	154
16	173
17	193
18	214
19	236
20	260
21	285
22	312
23	340
24	370
25	401
26	434
27	467
28	504
29	542
30	582
31	623
32	666
33	712
34	759
35	807
36	858
37	911
38	965
39	1023
40	1083
41	1144
42	1207
43	1276
44	1341
45	1411
46	1484
47	1559
48	1636
49	1716
50	1798
51	1883
52	1971
53	2061
54	2153
55	2249
56	2347
57	2448
58	2551
59	2657
60	2767



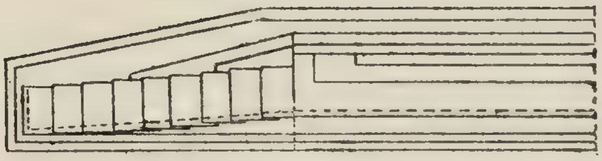
—END VIEW—



—SECTION—



—HALF OF FRONT ELEVATION—



—HALF OF PLAN—

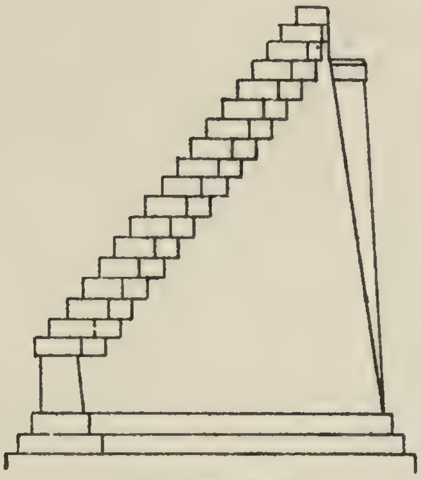
—BASE THICKNESS OF ABUTMENT AT TOP OF FOOTING COURSES, IS 4/10 OF HEIGHT TO SUB-GRADE.—

MASONRY IN BRIDGE ABUTMENTS.

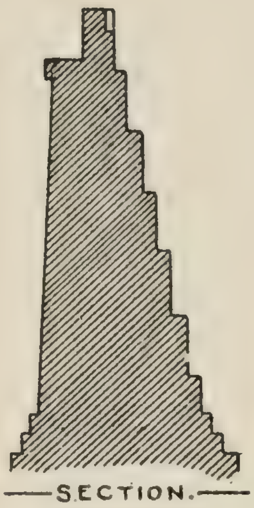
INCLUDING 3 FT. FOUNDATION

N.Y.W.S. AND B.RY. DOUBLE TRACK

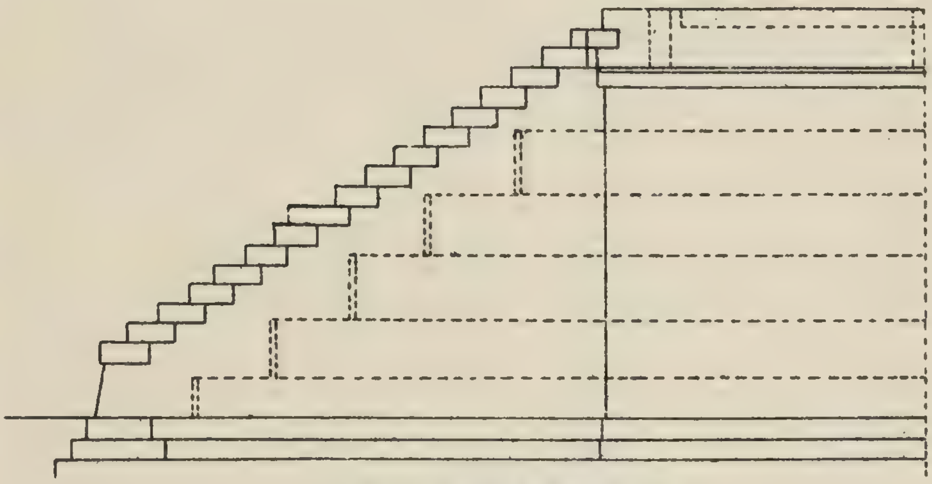
FT	Cu. Yds
5	28.5
6	36
7	44.5
8	54.5
9	65
10	76.5
11	89
12	102.5
13	117.5
14	133
15	150.5
16	168.5
17	188
18	209
19	231
20	254.5
21	279
22	305.5
23	333
24	361.5
25	392
26	424.5
27	458
28	493
29	530
30	568.5
31	609
32	651
33	694.5
34	740
35	787
36	836.5
37	866
38	919
39	974
40	1031
41	1084
42	1145
43	1197
44	1272
45	1341
46	1394
47	1482
48	1556
49	1632
50	1711
51	1792
52	1875
53	1972
54	2049
55	2140
56	2234
57	2330
58	2428
59	2529
60	2632



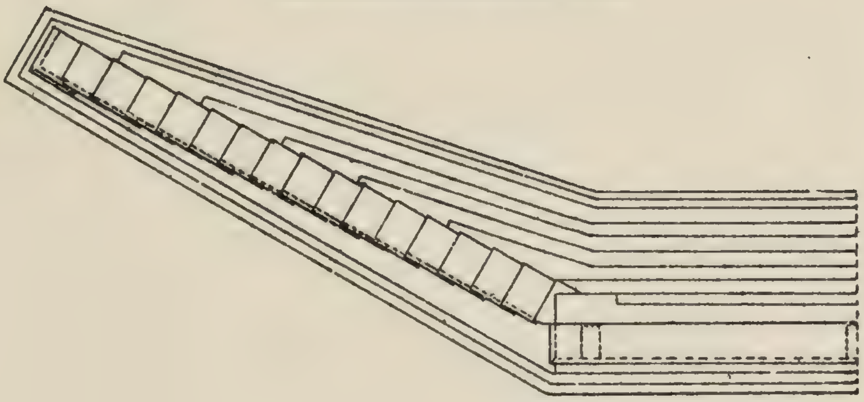
SIDE VIEW.



SECTION.



HALF OF FRONT ELEVATION.



HALF OF PLAN.

BASE THICKNESS OF ABUTMENT AT TOP OF FOOTING COURSES IS 4/10 OF HEIGHT TO SUB-GRADE.

-IRON BRIDGES, ALL DOUBLE TRACK.-

-WEIGHT, COST, AND COST PER FOOT CLEAR SPAN, AT CONTRACT RATES.-

-JUNE 1. 1882-

—N.Y.W.S & B AND N.Y.O.&W. Rys. —

CLEAR	STYLE OF	WEIGHT IN POUNDS		COST PER Ft CLEAR SPAN		TOTAL	COST
SPAN.	STRUCTURE.	DECK.	THROUGH	DECK.	THROUGH.	DECK.	THROUGH.
5	I Beam	27.00		$ 27.00	$.	$ 135.00	$
6	" "	31.00		25.83		155.00	
8	" "	41.00		25.62		205.00	
10	" "	61.00		30.50		305.00	
15	" "	96.00		32.00		480.00	
20	Plate Girder	149.00	23500	39.11	61.69	782.25	$123.75
25	" "	200.00	31500	42.00	66.15	1050.00	1653.75
30	" "	256.00	40000	44.80	70.00	1344.00	2100.00
35	" "	320.00	47000	48.00	70.50	1680.00	2467.50
40	" "	405.00	57300	53.15	75.20	2126.25	3008.25
45	" "	490.00	69000	57.16	80.50	2572.25	3622.50
50	Lattice Girder	555.00	72000	58.27	75.60	2913.75	3780.00
55	" "	623.00	84000	59.47	80.17	3270.85	4410.00
60	" "	697.00	96000	60.98	84.00	3659.75	5040.00
65	" "	777.00	108000	62.75	87.20	4079.25	5670.00
70	" "	902.00	120000	67.65	89.83	4735.50	6300.00
75	" "	1010.00	132000	70.70	92.40	5302.50	6930.00
100	Pin Connected	1800.00	180000	103.50	103.50	10350.00	10350.00
120	" "	2350.00	235000	112.60	112.60	13515.55	13515.55
140	" "	3000.00	300000	123.21	123.21	17250.50	17250.00
160	" "	3610.00	360000	129.69	129.69	20757.75	20757.75
180	" "	4400.00	440000	140.55	140.55	25300.00	25300.00
200	" "	5400.00	540000	155.25	155.25	31050.00	31050.00
225	" "	6890.00	689000	168.41	168.41	37892.50	37892.50
250	" "	7500.00	750000	272.50	172.50	43125.00	43125.00

Basis of Table, I Beams 5 cents, Plate and Lattice Bridges 5¼ cts, Pin Contd Trs 5½ c.

—STANDARD FARM AND ROAD BRIDGES —

—PILE AND TIMBER TRESTLE—

—FARM AND ROAD CROSINGS AND GRIDIRON CATTLE GUARD RACKS—

35 ft Timber Trestle, 12 ft between bents, Piles 35 ft long, @ $\$45^{00}$ for timber. Costs $\$19^{00}$ pr lin ft

30" Pile " " " " " " 30 " " " " " " " $\$17^{11}$ " " "

Farm and Road Crossing. For Highways $\$38^{00}$ For Farms $\$28\frac{1}{2}$ each

Farm and Highway Bridges from 14 to 18 ft wide $\$8^{00}$ and $\$10^{00}$ pr lineal foot.

Gridiron Cattle Guard Racks cost $\$21^{50}$ each

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BY
THE GRAPHIC CO.
N.Y.